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(54) System for scanning and reading symbols.

(57) A unitary hand-held bar code scanner and reader produces an elliptical beam, oriented with its major axis along the direction of the bars, utilizing optics employing far field diffraction effects to shape the beam and maintain its elliptical aspect (length to width ratio) constant over a distance in front of the scanner were bar codes may be located. The optics eliminates parallax even though the photodetector and light source (preferably a laser diode) are located offset from each other on a board on which the optics are mounted. A housing assembly has channels which mount the board therein without shock absorbing devices. A digital microcomputer controller and peripheral devices regulate the optical power output from the laser diode and prevents catastrophic failure, if the electrical current through the laser diode exceeds safe limits. Digital control of the gain of the electronic circuits which provide the signals from which bar code information can be decoded and for the operation and control of a motor for oscillating a deflector which scans the beam across the code are also provided utilizing the microcomputer. The microcomputer also controls interface circuits to provide compatibility with auxiliary equipment and host computers which generate commands and requires data inputs of various polarity and format.

When the scanner is mounted on an upright support which extends from a base of a stand, the ratio of the number of generated pulses to the reflected pulses is computed for a succession of pulses (ten pulses for example). Then the presence of the label is detected and the system, implemented in an application program in the microprocessor controller of the bar code scanner initiates scanning of the bar code when the ratio differs from a certain value. Upon the detection of the code (a good read) or under conditions where the label is removed before detection, or is not removed after detection, the scanning mode is discontinued and the pulsing mode is again initiated. The pulsing mode is initiated continually to test for the presence of a object carrying a bar code label, when not scanning.

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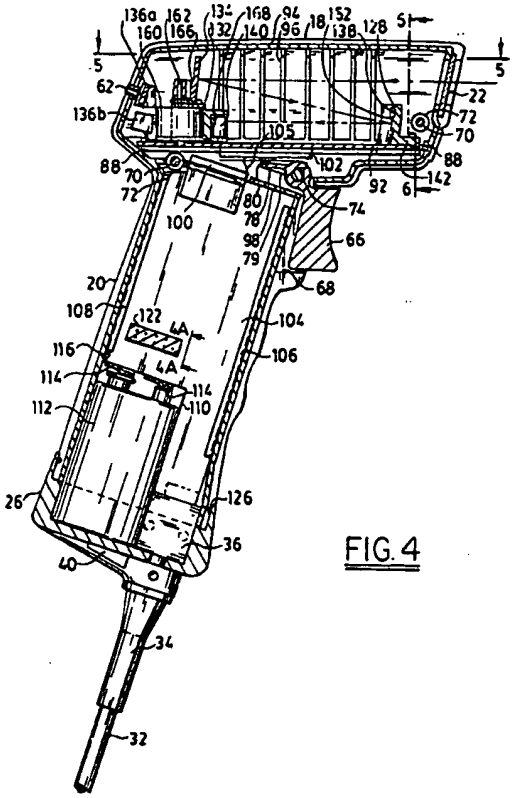
136a
162
160
166
168
94
96
18
152
138
128
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62
136b
22
72
70
105
88
70
72
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92
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142
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80
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108
122
4A
104
116
4A
106
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114
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110
126
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FIG. 4

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DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	EP-A-0 319 164 (METROLOGIC INSTRUMENTS) * the whole document * ---	1-5	G 06 K 7/10
A	PATENT ABSTRACTS OF JAPAN vol. 6, no. 005 (P-097)13 January 1982 & JP-A-56 129 975 (DAIFUKU CO LTD) 12 October 1981 * abstract * ---	1,3	
A	PATENT ABSTRACTS OF JAPAN vol. 12, no. 271 (P-736)28 July 1988 & JP-A-63 053 513 (HITACHI LTD) 7 March 1988 * abstract * ---	2,3	
Y A	US-A-4 528 444 (HARA ET AL.) * abstract; claims 1-6; figure 1 * ---	15 13,14, 16,17	
Y A	EP-A-0 364 676 (SYMBOL TECHNOLOGIES, INC) * claims 1-11; figures 1-3 * ---	15 13,14, 16,19	TECHNICAL FIELDS SEARCHED (Int. Cl.5)
A	EP-A-0 378 199 (SUMITOMO ELECTRIC INDUSTRIES, LTD) * the whole document * ---	13	G 06 K G 02 B
Y	PATENT ABSTRACTS OF JAPAN vol. 11, no. 328 (P-629)27 October 1987 & JP-A-62 111 247 (FUJI XEROX CO LTD) 22 May 1987 * abstract * --- -/-	20,21	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	21-07-1993	CHIARIZIA S J

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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& : member of the same patent family, corresponding document

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

☐ All claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for all claims.

☐ Only part of the claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid,

namely claims:

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions,
namely:

see sheet -B-

☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid,

namely claims:

☐ None of the further search fees has been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims,

namely claims:

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DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
Y	PATENT ABSTRACTS OF JAPAN vol. 11, no. 265 (E-535)27 August 1987 & JP-A-62 069 577 (USHIO INC) 30 March 1987 * abstract *	20-21	
Y	GB-A-2 134 679 (SYMBOL TECHNOLOGIES INC.) * abstract; claims 1-4; figures 4,9 * * column 7, line 34 - line 44 *	22,23	
Y	US-A-4 973 866 (WANG) * the whole document *	22,23	
Y A	US-A-4 521 678 (WINTER) * figure 2 *	24 25	
Y	US-A-4 896 026 (KRICHEVER) * figures 2,4 *	24	
A	EP-A-0 367 300 (SYMBOL TECHNOLOGIES, INC)	24,26, 27	TECHNICAL FIELDS SEARCHED (Int. Cl.5)
A	US-A-4 766 297 (MC MILLAN) * abstract; figure 1 *	28,33, 34	
A	EP-A-0 392 564 (TOKYO ELECTRIC CO., LTD.) * column 2, line 53 - column 3, line 27; figure 2 *	28,33, 34	

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The present search report has been drawn up for all claims

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	US-A-4 694 182 (HOWARD) * column 3, line 21 - line 30; figure 3 * ---	28,33, 34	
Y	EP-A-0 429 243 (M.M.M.) * claims, figures *	7,8	
A		9-12	
Y	PATENT ABSTRACTS OF JAPAN, vol. 014, no. 442 (P-1109) 20 September 1990 * & JP-A-02 173 781 (TOSHIBA) 5 July 1990 * abstract * ---	7,8	
A	EP-A-0 310 711 (HITACHI) * claims, figures * -----	7	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

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